No place like home?

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Chapter 5

'THE OLDER ADULT' DOESN'T EXIST. USING VALUES TO DIFFERENTIATE OLDER ADULTS IN THE DUTCH HOUSING MARKET.

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Abstract

To date most prognoses of older adults in the housing market have been based on average housing preferences and average housing market behaviour of all persons in a certain age cohort. Due to social-cultural and social-economic dynamics, the relationship between age and housing is expected to change for successive cohorts. This study sets out to improve housing preferences estimates by recognizing the growing differentiation among older adults. This heterogeneity is analysed by differentiating older adults on their lifestyles (operationalized as values), using latent class analysis as a clustering technique. These analyses result in older adults being classified into five segments on the basis of their viewpoints, motivations and attitude. Next, for each lifestyle segment a separate discrete choice model is estimated, offering insight in the relative importance that these segments give to various housing attributes. The findings demonstrate advantages over a traditional, single model approach and can be helpful in formulating contemporary housing policy.

Keywords: Housing choice; housing and environment; housing market; housing preferences; lifestyle; older adults

5.1. Introduction

Like many in other Western countries, the Dutch population is ageing rapidly (Christensen et al., 2009). The related changes in the number and proportion of older adults in our population have numerous implications (Kim, 2011). One associated issue is the provision of (suitable) housing for older adults. In order to plan housing provision successfully, knowledge about the housing preferences of older adults is crucial (Abramsson & Andersson, 2016). Housing preferences are traditionally predicted on the basis of several socio-demographic characteristics such as, for example, age (Van Diepen & Arnoldus, 2003). This method assumes that social background may both create opportunities and limit choices (Ganzeboom, 1988) and also that all persons of a certain age behave the same on the housing market (Moschis et al., 2003). However, people who share the same social background may have totally different preferences and behavioural patterns, whereas people with different backgrounds can share the same preferences and behavioural patterns (see e.g. Gunter & Furnman, 1992, Michelson & Reed, 1975; Pinkster & Van Kempen, 2002; Wells, 1974). Due to social-cultural and social-economic structures, the relationship between age and housing is expected to be different for successive cohorts (Hooimeijer, 2007; Wulff et al., 2010). In other words, the next generation of older adults is expected to behave differently on the housing market than what is considered to be common for the existing generation of older adults. As a result, it has been argued that socio-demographic characteristics alone are no longer sufficient to predict the housing preferences of (older) consumers (see e.g. Heijs et al., 2009, 2011; Jansen, 2012).

In marketing, it has become common to use lifestyle variables as a supplement to socio-demographic characteristics in the prediction of preferences (Jansen, 2012). The concept of lifestyle was introduced in the 1950s to better understand, explain and predict consumer behaviour in order to focus marketing strategies (Anderson & Golden, 1984). Since every product could have its own lifestyle typology, numerous lifestyle typologies were developed. Typically, studies included up to 200 or 300 different items on activities, interests and opinions (Jansen, 2012). A data reduction technique, such as factor analysis, would then be used to obtain a smaller number of psychographic dimensions (Wedel & Kamakura, 2000).

The purpose of the current study is to identify heterogeneity among older adults by differentiating segments of older adults who have (more or less) the same viewpoints, motivations and attitude with respect to housing. Subsequently, we intend to improve the understanding of older adults' housing preferences by offering insight in the relative importance these segments of older adults give to various housing attributes. In doing so, we aim to contribute to a better grounding of housing policy with respect to the

apparent diversity within the older population. From the beginning of the twenty-first century, the Dutch government has focussed on ageing in place-policies and living independently as long as possible to keep costs for care maintainable (Van Dijk et al., 2013). As such, much attention is given to solving the shortage of suitable housing (Van Galen & Faessen, 2014) and this is the perfect time to make sure heterogeneous demands are met by differentiated supply.

5.2. Segmentation of older adults

Several approaches have been used for segmenting the senior market (Weijters & Geuens, 2003). Dividing the older population by age is the easiest way to segment the senior market into subgroups (see e.g. Tréguer, 1998). The prevailing criticism of the age approach stresses the arbitrariness of age boundaries and the relativity of age (Gunter, 1998; Wilkes, 1992; Wulff et al., 2010). Alternatives to the age approach are lifestyle segmentation (see e.g. Hesse, 1991), and 'Gerontographics' (Moschis, 1993, 1996).

Lifestyle segmentation uses psychographic[1] instruments to differentiate the senior market. Among the psychographic instruments, the Values And Lifestyles (VALS) and the List of Values (LOV) scales have received a lot of attention (Wedel & Kamakura, 2000). The VALS survey was initially based on Maslow's need hierarchy (Weijters & Geuens, 2003), and identifies four groups: need-driven, outer-directed, inner-directed and integrated. The LOV survey (Beatty et al., 1985) contains nine values: self-respect, self-fulfilment, accomplishment, being well respected, fun and enjoyment, excitement, warm relationship with others, a sense of belonging, and security. Even though psychographic instruments have been criticized (see e.g. Heijs et al., 2009, 2011; Jansen, 2012), they have proven their value in market segmentation when they are combined with more product-specific variables such as media usage (Wedel & Kamakura, 2000).

Criticism on senior market segmentation emphasizes the use of generally applicable lifestyles scales and, therefore, the lack of adaptation to older adults (Weijters & Geuens, 2003). However, applications specifically adapted to older adults can be found in the literature (see for e.g. Day et al., 1988; Fox & French, 1985; Gollub & Javitz, 1989; Sorce et al., 1989). These studies developed lifestyle segments by differentiating the market segments using four to six classifications. The LAVOA-segmentation (Lifestyles and Values of Older Adults), for example, identifies six distinct psychographic segments of older adults: Explorers, Adapters, Pragmatists, Attainers, Martyrs, and Preservers (Gollub & Javitz, 1989).

1 Such as personality traits, lifestyles, attitudes, expectations and activities.

Another alternative to the age approach can be found in Moschis' Gerontographics (1993, 1996). Moschis divides the senior market into life stage groups based on two dimensions: psycho-social ageing and biological ageing. This results in the following four groups: healthy indulgers (young on both dimensions), ailing outgoers (older adults only on the biological dimension), healthy hermits (older adults only on the psycho-social dimension) and frail recluses (older adults on both dimensions). Criticism of this approach stresses the lack of clarity and transparency (Weijters & Geuens, 2003). Clear instructions for measurement are missing, as are indications concerning the location of cut-off points on both dimensions. Moreover, since both dimensions refer to a process of gradual decline, Gerontographics reduces older adults to an ageing subject. Although ageing and its effects are real, and should not be ignored, researchers and practitioners should not be biased towards a one-sided focus on ageing phenomena (Weijters & Geuens, 2003). The idea that older adults should not be seen just as aged people with capability constraints is gaining importance. Most older adults are active, mobile, healthy and productive, even if they are not gainfully employed. The experience of daily living focused more narrowly on people's homes and immediate environments tends to occur in the later stages of old age (Droogleever Fortuijn et al., 2006).

5.3. Methods

In this study, we use a lifestyle segmenting approach to determine meaningful segments in the Dutch senior market. Lifestyle can be operationalized in various ways. The most frequently occurring operationalisations of lifestyle are based on the following: (1) behaviour only; (2) latent variables only (e.g. attitudes, opinions); (3) a mix of behavioural and latent variables; (4) a combination of socio-demographic characteristics; and (5) a combination of socio-demographic characteristics and other variables (Jansen, 2011).

This study operationalizes the concept of lifestyle on the basis of latent variables (2), in the form of values. Since values are known to be relatively stable, lifestyle segments based on values are likely to be more stable over time than those based solely on activities, interests and opinions (Weijters & Geuens, 2003). Values play an important role in explaining people's behaviour in general (Rokeach, 1973), and their choice behaviour in particular (Bettman, 1979). Values can thus be seen as objectives that – either consciously or unconsciously - influence all human actions. In this way the consumer is approached as a goal oriented being, who chooses a particular house in order to satisfy values that are important to him or her (Bijker et al., 2012).

In order to explore the influence of values on housing preferences we use Brand Strategy Research (BSR) (Brethouwer et al., 1995; Oppenhuisen, 2000), which is a theoretical framework that identifies motivational groups or clusters based on Adler's social-psychology theory (for more information see Callebaut et al., 1999). As such, it gives knowledge of consumers' fears, beliefs and values, thus providing an understanding of the fundamental motivations that drive people's (future) housing decisions (Van Hattum & Hoijtink, 2009). The BSR framework consists of a strategic map in which 148 psychographic items (see Appendix 5.1) are presented. Two axes divide the map. The first (horizontal) axis is called the 'sociological' axis and indicates how a person relates to their social environment (Van Hattum & Hoijtink, 2009): the right side indicates involvement (belonging); the left side indicates independence (affirmation). The second (vertical) axis is called the 'psychological' axis and indicates how a person handles 'tensions' (Van Hattum & Hoijtink, 2009): the top side indicates an expression of 'tensions' (extravert) and the bottom side indicates a suppression or ignorance of 'tensions' (introvert). The result is a four-quadrant strategic map as shown in Figure 5.1.

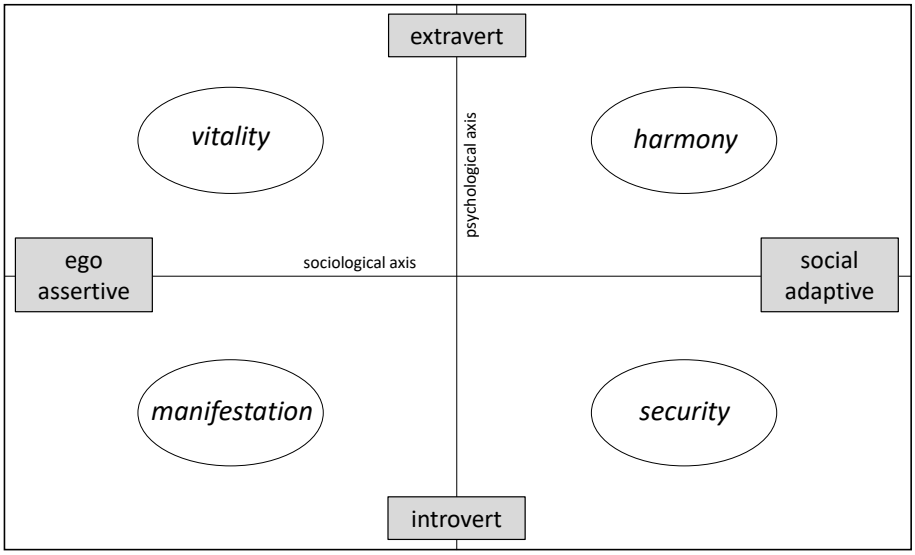

Figure 5.1 BSR Strategic Map (with kind permission from Springer Nature: Journal of Classification, doi:10.1007/s00357-009-9040-1, 2009, page 4, Van Hattum & Hoijtink, Figure 1)

The idea behind BSR is that the four quadrants in the strategic map represent four main motivational clusters which can be found in each researched domain; in this case housing. Each of these clusters demonstrates unique needs, motivations and products or services

and communication requirements (Van Hattum & Hoijtink, 2009). In a given domain it is also possible that mixtures of these four main clusters are found. The four main motivational clusters in BSR are:

Cluster 1. In the upper left quadrant, a cluster that is described with the word 'Vitality'. Persons from this cluster are self-conscious, self-confident in their attitude towards (choices in) life and energetic, vital and passionate in their behaviour.

Cluster 2. In the lower left quadrant, a cluster that is described with the word 'Manifestation'. Persons from this cluster are career oriented and aspire to have a certain (high) status in life in connection with certain status symbols and conspicuous consumption.

Cluster 3. In the upper right quadrant, a cluster that is described with the word 'Harmony'. Persons from this cluster strive for harmony in every aspect of life and harmonious relations with all people they meet in daily life.

Cluster 4. In the lower right quadrant, a cluster that is described with the word 'Security'. Persons from this cluster are mainly oriented on their peer group and the rules and values of this group.

The respondents are asked to choose items which describe themselves best from the list of 148 psychographic items in the BSR framework. From previous research it is known that the psychographic items in the BSR framework can be presented in the strategic map in more or less the same way in each researched domain (Brethouwer et al., 1995; Oppenhuisen, 2000). For example, persons who are assigned to the main motivational cluster that can be described by the word 'Manifestation' are more likely to pick psychographic items like: 'Self-assured', 'Build a successful career', 'Manager'. Within each motivational cluster, not only the individual items are more likely to be picked, but also pairs of items. For example, persons who pick item 'Manager' are more likely to also pick item 'Success in life'. Likewise all other items within the BSR framework can be pre-assigned to one of the four main motivational clusters. Consequently, previous research using the BSR framework provides us with a substantial amount of prior knowledge about which combinations of items are more likely to be picked (Van Hattum & Hoijtink, 2009). This prior knowledge is used in our model based clustering approach, to determine which interaction effects are included on our model in order to find the four main motivational clusters (for more information see: Van Hattum & Hoijtink, 2009). The model based clustering approach will be discussed in more detail in the next section.

5.3.1. Latent class analysis

The respondents are clustered according to psychographic items they selected by conducting a latent class analysis. A latent class analysis is appropriate because our hypotheses are that discrete lifestyle preferences exist, that these lifestyles are not directly identifiable from the data, and that older adults with different lifestyles will exhibit different housing preferences. An important difference between standard clustering (Hair et al., 1984) and latent class analysis (Banfield & Raftery, 1993; Bensmail et al., 1997; Fraley & Raftery, 1998; Newcomb, 1886; Pearson, 1894; Vermunt & Magidson, 2000) is that in the latter it is assumed that the data are generated by a certain mixture of underlying probability distributions. An advantage of this probabilistic approach is that the cluster criterion (Hair et al., 1984; Wedel & Kamakura, 2000), which is usually difficult to define and calculate for complex models, is not needed. A further advantage of this approach is that uncertainty about a respondent's cluster membership is taken into account (Van Hattum & Hoijtink, 2009).

In recent years latent class analysis (e.g. model based clustering) has become a popular clustering technique, resulting in numerous papers with specific latent class analysis approaches and their applications (see e.g. Fraley & Raftery, 1998; Hoijtink & Notenboom, 2004; Ter Braak et al., 2003; Van Hattum & Hoijtink, 2009; Vermunt & Magidson, 2000; Wedel & Kamakura, 2000).

Model specifications

Let x_{ij} represent the response of respondent $i = 1, \ldots, N$, to item $j = 1, \ldots, J$, $x_{ij} \varepsilon\{0,1\}$, where 1 indicates that respondent i picked item j and 0 indicates that respondent i did not pick item j. The N x J matrix X contains the item responses. The J vector x_i is defined as a vector containing the response pattern or item responses of respondent i. The N vector x_j is defined as a vector containing the responses of the respondents to item j.

Each of the J items is characterized by a parameter $\pi_{j|q}$, that is the probability of responding 1 to item j in cluster q. Note that, $\pi = \{\pi_1, \ldots, \pi_q, \ldots, \pi_Q\}$ and $\pi_q = \{\pi_{1|q}, \ldots, \pi_{j|q}, \ldots, \pi_{J|q}\}$.

Let $\omega = \{\omega_1, \ldots, \omega_q, \ldots, \omega_Q\}$ be the Q vector containing the cluster weights, that is, the proportion of persons allocated to each cluster and let $\omega_{q|i}$ denotes the probability that respondent i belongs to latent cluster q. The N vector τ contains the unobserved cluster memberships for each person $\tau = \{\tau_1, \ldots, \tau_i, \ldots, \tau_N\}$, where $\tau_i \varepsilon\{1, \ldots, Q\}$.

The general form of the data likelihood of the model based cluster model is given by

$$L(X|\pi, \lambda, \omega) = \prod_{i=1}^{N} \sum_{q=1}^{Q} \omega_q P(x_i|\tau_i = q).$$

The probability $P(x_i|\tau_i = q)$ is defined as follows

$$P(x_i|\tau_i = q) = \prod_{j=1}^{J} P(x_{ij}|\tau_i = q),$$

with

$$P(x_{ij}|\tau_i = q) = \pi_{j|q}^{x_{ij}}(1 - \pi_{j|q})^{1-x_{ij}}.$$

A commonly used criterion for estimating the parameters cluster specific probabilities (π) and cluster weights (ω) is maximum likelihood (ML). In order to find the ML estimaters we used two well-known algorithms: EM (Dempster et al., 1977) and Newton-Raphson (Haberman, 1988). The EM algorithm is an iterative algorithm that contains the following steps: In the very first iteration of the EM-algorithm the respondents are randomly divided into Q clusters.

E-step

1. $\omega_{q|i} = \frac{\omega_q P(x_i|\tau_i=q)}{\sum_{q'=1}^{Q} \omega_{q'} P(x_i|\tau_i=q')}$, for $q = 1, \ldots, Q$ and $i = 1, \ldots, N$

M-step

1. $N_q = \sum_{i=1}^{N} \omega_{q|i}$, for $q = 1, \ldots, Q$

2. $\omega_q = \frac{N_q}{N}$, for $q = 1, \ldots, Q$

3. $\pi_{j|q} = \frac{\sum_{i=1}^{N} \omega_{q|i} x_{ij}}{\sum_{i=1}^{N} x_{ij}}$, for $j = 1, \ldots, J$ and $q = 1, \ldots, Q$

A problem with the EM algorithm is when to stop. The EM algorithm stops when the parameters hardly change from one iteration to the next. However, Wedel and Kamakura (2000) describe that this is a lack of progress, rather than a measure of convergence and that there is evidence that the EM-algorithm is often stopped too early. In order to avoid this problem, the speed of convergence of the Newton-Raphson method is used when close to the optimal solution. The software Latent GOLD by Statistical Innovations Inc. is used for estimation.

Number of clusters

The remaining aspect of the model specification is to determine the number of clusters. The problem of identifying the number of latent clusters is still without a satisfactory statistical solution and one of the main research topics in model-based clustering (Wedel & Kamakura, 2000). When selecting the number of segments a trade-off needs to be

made. The more clusters one has, the greater the extent to which the analysis reflects the diversity observed in the data (Van Hattum & Hoijtink, 2010). This suggests that having a large number of clusters is desirable. But the more clusters one has, the greater the risk that the diversity that is identified is meaningless: only reflecting the properties of the specific data used in the analysis rather than the diversity observable in the world at large (Van Hattum & Hoijtink, 2010). This suggests it is preferable to have fewer clusters. The most widely used method of determining the number of latent clusters is by using the Bayesian Information Criterion (BIC) and Consistent Akaike Information Criterion (Wedel & Kamakura, 2000). In general, the cluster solution with the lowest value of the information criterion is preferred.

In this study the number of clusters is determined through a combination of statistical information (e.g. the BIC) and interpretation of the model results. Successive models are estimated with varying numbers of clusters and statistics are used to compare different models. Besides looking at the information criteria the cluster solutions are also tested against several criteria of segmentation, such as 'identifiability'. This means that the respondents allocated to each segment are similar in some relevant way. In addition we checked whether each segment of respondents is relatively unique, compared to the other segments that have been constructed. In examining the estimation results, we have selected the six-cluster solution model because it provides the most satisfying behavioural interpretation in terms of resulting lifestyle segments and subsequent segment-specific choice models (primarily lack of anti-intuitive signs and interpretability of clusters). The results of the six-cluster solution model are discussed in detail in the 'results' section.

Data

The data were collected in the summer of 2011 in cooperation with a housing association in the city of Groningen in the Netherlands. The respondents were drawn initially from the directory of the housing association. Since this sample consisted solely of tenants, the sample was extended with owner-occupiers[2]. The total sample consisted of 6,684 people, aged 55 years or older, all living in the municipality of Groningen. In total 1,010 respondents participated in the research (a response rate of 15%). Based on the six-cluster solution model, we were able to determine the lifestyle of 996 respondents. Subsequently, for each lifestyle segment a separate discrete choice model was estimated, offering insight in the relative importance these segments give

2 In 2015, around 56% of the 7.6 million dwellings the Dutch housing market are owner-occupied. The social housing represents 30% of total housing stock, making it an important player on the Dutch residential housing market. Private renting, which is not included in this study, accounts for 13% of the total housing stock (Systeem woningvoorraad, 2016).

to various housing attributes. Ultimately 952 of the 1,010 data records (i.e. respondents) were completed and therefore suitable for further analyses. Of these records, we were able to determine the lifestyle of 934 respondents.

This study is not free of limitations. Although this study provides empirical results for the Dutch elderly market in general, and the older adults in Groningen in particular, the study may have limitations in generalizing to other markets. There might be some differences between the Dutch way of thinking, cultural environment, traditions and lifestyle and those of other nations. Another limitation is the data collection method. The quality of the data used in this research may be affected by the fact that we used a computer assisted questionnaire. Compared to, for example, the data of the Housing Research Netherlands (HRN) survey[3], higher educated older adults are overrepresented in our sample, most probably due to the use of the a computer assisted questionnaire. Consequently, we correct for a potential education effect in our analysis.

5.4. Results

Taking into account both the statistical information criteria, and several criteria of good segmentation as discussed above, it turns out that with the dataset at hand the number of clusters should be $Q = 6$.

The row 'ω_q' in Table 5.1 displays the cluster weights for the Q = 6 solutions. From the row 'ω_q' it can be seen that Clusters 1 ($\omega_1 = 0.240$), 2 ($\omega_2 = 0.211$), 3 ($\omega_3 = 0.200$), 4 ($\omega_4 = 0.172$) and 5 ($\omega_5 = 0.168$) have relatively large cluster weights and are supposed to be substantial. Cluster 6 ($\omega_6 = 0.010$) has a relatively small cluster weight, representing only 10 respondents from the data set. Due to this small cluster weight this cluster is considered to be an outlier and not substantial. Therefore we focus on the five remaining clusters, which according to their cluster weights are large enough to consider in the analysis. Table 5.1 shows the item probability per cluster for the items concerning several character traits. These item probabilities $P(x_{ij} = 1|\tau_i = q)$, for $j = 1,\ldots,148$) are used in the cluster descriptions, and can be calculated as follows:

$$P(x_{ij} = 1|\tau_i = q) = P(x_{ij} = 1|x_i, \pi_q, \tau_1 = q) = \pi_{j|q}$$

3 The Housing Research Netherlands (HRN) survey is a large cross sectional survey in which information is gathered about the housing situation of people living in the Netherlands. The HRN dataset is representative of the Dutch population aged 18 and above, not living in an institution.

Table 5.1 Cluster Specific Item Probabilities for the Q = 6 Solution. $P_1 = P(x_{i1}=1|\tau_i=q)$,..., $P_{35}(x_{i35}=1|\tau_i=q)$

q		1	2	3	4	5	6
ω_q		0.240	0.211	0.200	0.172	0.168	0.010
P1	A little bit shy	0.130	0.057	0.271	0.082	0.042	0.200
P2	Adventurous	0.004	0.057	0.050	0.281	0.114	0.100
P3	Capable	0.029	0.000	0.050	0.135	0.150	0.200
P4	Cosy	0.410	0.405	0.040	0.158	0.108	0.000
P5	Energetic	0.113	0.138	0.030	0.222	0.168	0.200
P6	A little imprudent	0.000	0.024	0.020	0.023	0.012	0.000
P7	Honest	0.611	0.490	0.407	0.421	0.497	0.600
P8	Jovial	0.033	0.076	0.015	0.023	0.036	0.000
P9	Opinionated	0.100	0.110	0.161	0.216	0.138	0.400
P10	Self-assured	0.151	0.100	0.131	0.292	0.198	0.300
P11	Serious	0.322	0.276	0.392	0.251	0.317	0.500
P12	Spontaneous	0.209	0.276	0.035	0.164	0.108	0.200
P13	A little bit impatient	0.134	0.138	0.196	0.135	0.186	0.200
P14	Assertive	0.151	0.067	0.055	0.123	0.162	0.000
P15	Cheerful	0.218	0.295	0.045	0.135	0.114	0.100
P16	Critical	0.238	0.114	0.347	0.450	0.359	0.500
P17	Enthusiastic	0.230	0.171	0.015	0.205	0.204	0.000
P18	Gentle	0.205	0.181	0.206	0.216	0.024	0.300
P19	Intelligent	0.167	0.048	0.196	0.520	0.389	0.300
P20	Sympathetic	0.188	0.210	0.126	0.211	0.138	0.000
P21	Ordinary	0.251	0.381	0.427	0.041	0.138	0.400
P22	Self-confident	0.092	0.148	0.075	0.123	0.251	0.100
P23	Down-to-earth	0.272	0.386	0.427	0.234	0.353	0.400
P24	Strong character	0.138	0.124	0.055	0.216	0.156	0.400
P25	Easy going	0.096	0.110	0.020	0.058	0.018	0.100
P26	Balanced	0.176	0.152	0.136	0.222	0.317	0.000
P27	Classy	0.029	0.019	0.015	0.041	0.054	0.000
P28	Deliberate	0.130	0.152	0.332	0.129	0.174	0.400
P29	Leader	0.054	0.124	0.025	0.170	0.413	0.100
P30	Helpful	0.607	0.671	0.322	0.433	0.341	0.300
P31	Interested in others	0.569	0.433	0.080	0.561	0.281	0.100
P32	Neat	0.305	0.262	0.196	0.035	0.108	0.000
P33	Passionate	0.000	0.043	0.015	0.047	0.024	0.000
P34	Serene	0.130	0.243	0.377	0.105	0.198	0.000
P35	Commercial	0.063	0.090	0.136	0.041	0.216	0.100

5.4.1. Describing the motivational clusters

Using the item probabilities from Table 5.1 each of the five remaining latent clusters can be described in terms of probabilities. As illustrated in Fig. 5.1, the idea behind the BSR framework is that there are four main motivational clusters, which has been found useful in marketing (Brethouwer et al., 1995). All other clusters are considered to be combinations in terms of description of these four main clusters.

Cluster 1, with higher cluster-specific probabilities on the items 'Honest' ($P(x_{i7} = 1|\tau_i = 1) = 0.611$), 'Helpful' ($P(x_{i30} = 1|\tau_i = 1) = 0.607$), and 'Neat' ($P(x_{i32} = 1|\tau_i = 1) = 0.305$), is a combination of the two main motivational clusters that can be described with the words 'Harmony' and 'Security' in Fig. 5.1. Cluster 2 corresponds with the cluster in the upper right quadrant in the BSR strategic map (see Fig. 5.1). This cluster is described with the word 'Harmony'. Looking at Table 5.1, it can be seen that, for example, the items 'Cosy' ($P(x_{i4} = 1|\tau_i = 2) = 0.405$), 'Spontaneous' ($P(x_{i12} = 1|\tau_i = 2) = 0.276$), and 'Helpful' ($P(x_{i30} = 1|\tau_i = 2) = 0.671$) have higher cluster-specific probabilities for Cluster 2, which corresponds with the description of this main motivational cluster in Fig. 5.1. Likewise, the items 'A little bit shy' ($P(x_{i1} = 1|\tau_i = 3) = 0.271$), 'Ordinary' ($P(x_{i21} = 1|\tau_i = 3) = 0.427$), and 'Down-to-earth' ($P(x_{i23} = 1|\tau_i = 3) = 0.427$) have higher cluster-specific probabilities for Cluster 3, which corresponds with the description of the main motivational cluster that can be described with the word 'Security' in Fig. 5.1. The items 'Adventurous' ($P(x_{i2} = 1|\tau_i = 4) = 0.281$), 'Energetic' ($P(x_{i5} = 1|\tau_i = 4) = 0.222$), and 'Opinionated' ($P(x_{i9} = 1|\tau_i = 4) = 0.216$) have higher cluster-specific probabilities for Cluster 4, which corresponds with the description of the main motivational cluster that can be described with the word 'Vitality' in Fig. 5.1. The items 'Critical' ($P(x_{i16} = 1|\tau_i = 5) = 0.359$), 'Leader' ($P(x_{i29} = 1|\tau_i = 5) = 0.413$), and 'Commercial' ($P(x_{i35} = 1|\tau_i = 5) = 0.216$) have higher cluster specific probabilities for Cluster 5, which corresponds with the description of the main motivational cluster that can be described with the word 'Manifestation' in Fig. 5.1. The cluster specific probabilities for the items of the other 113 psychographic items (see Appendix 5.2) can be interpreted and used for identifying and describing the motivational clusters in a similar manner.

In addition, we can further describe the motivational clusters by relating the five motivational clusters to several socio-demographic characteristics and several characteristics of the current housing situation of the respondents.

Table 5.2 Socio demographics and current housing attributes for the Q = 6 Solution

	Whole sample	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Socio-demographics in %						
Gender						
Male	53.7	10.5	80.5	76.4	40.9	68.9
Female	46.3	89.5	19.5	23.6	59.1	31.1
Age						
55-64	65.2	58.6	61.0	66.8	79.5	67.7
65-74	23.8	30.1	26.7	21.1	17.0	24.0
75+	9.6	11.3	12.4	12.1	3.5	8.4
Household composition						
Single	45.8	63.2	18.1	54.3	62.6	31.1
Couple, no children living at home	44.1	28.9	70.5	36.7	27.5	58.1
Single parent	2.9	3.8	1.4	1.5	5.3	1.8
Couple, with children living at home	5.9	2.5	9.5	7.0	4.1	6.6
Other composition	1.3	1.7	0.5	0.5	0.6	2.4
Educational level						
Low	31.3	50.6	44.3	31.7	5.8	10.9
Middle	23.3	23.8	28.1	25.6	15.2	24.0
High	41.9	21.3	23.3	37.2	77.8	64.1
Current dwelling attributes in %						
Tenure						
Rental	52.3	59.8	53.8	64.8	46.2	29.9
Owner-occupied	47.7	40.2	46.2	35.2	53.8	70.1
Type						
Detached	5.8	2.9	5.7	3.0	5.8	12.6
Non-detached, with garden	41.8	37.7	45.2	36.2	52.0	38.3
Non-detached, without garden	3.7	4.6	1.9	5.5	1.8	3.6
Apartment	49.1	54.8	47.1	55.3	40.4	45.5
Internal access						
Multiple floors	47.3	41.8	47.6	44.2	59.6	47.9
One floor	52.7	58.2	52.4	55.8	40.4	52.1
External access						
Elevator	28.8	33.5	31.4	32.2	17.5	26.3
Staircase	23.0	23.4	16.2	28.6	23.4	25.1
No elevator and/or staircase needed	48.2	43.1	52.4	39.2	59.1	48.5

Table 5.2 Socio demographics and current housing attributes for the Q = 6 Solution

	Whole sample	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Current neighbourhood attributes in %						
Tenure						
Mixture of owner-occupied and rental dwellings	54.4	57.7	56.2	59.3	51.5	42.5
Mainly rental dwellings	13.8	15.5	11.9	20.1	13.5	5.4
Mainly owner-occupied	31.9	26.8	31.9	20.6	35.1	52.1
Neighbours						
Mixture of single households, families and older adults	73.2	78.2	65.2	74.4	80.1	67.7
Mainly older adults	9.3	9.2	10.5	10.6	3.5	11. 4
Mainly families	17.5	12.6	24.3	15.1	16.4	21.0
Location						
Edge of the city	52.2	52.7	57.6	54.3	43.3	51.5
Around inner city	34.7	32.2	32.4	33.7	41.5	35.9
Inner city	13.2	15.1	10.0	12.1	15.2	12.6
Daily supplies						
Walking distance	68.6	71.1	65.7	74.4	66.7	63.5
Cycling distance	27.2	25.1	29.0	21.6	30.4	31.7
Driving distance	4.2	3.8	5.2	4.0	2.9	4.8
Care facilities						
Walking distance	47.8	51.5	48.6	44.2	44.4	49.7
Cycling distance	43.5	39.7	44.8	46.2	48.5	38.3
Driving distance	8.7	8.8	6.7	9.5	7.0	12.0
Public transport						
Good access	93.2	95.4	91.0	93.0	94.2	91.0
Poor access	6.8	4.6	9.0	7.0	5.8	9.0
n	1010	239	210	199	171	167

Table 5.2 reveals that cluster 1 (i.e. Harmony and Security) is characterized by a relatively large portion of females, 'old-elderly' (e.g. 75+), and a relatively low educational level. Respondents in this cluster are often living in rental apartments situated in neighbourhoods with a mixture of single households, families and older adults. Cluster 2 (i.e. Harmony) has a relatively large share of couples without children (living at home). A relatively large portion of respondents in this cluster tend to live in neighbourhoods with predominantly (other) families. The majority of respondents in cluster 3 (i.e. Security) are males. They tend to live alone in rental apartments (with a relatively large portion accessible by a staircase) in a neighbourhood

with predominantly other rental dwellings. Cluster 4 (i.e. Vitality) is characterized by a relatively large group of females, 'pre-elderly' (e.g. 55-64), and highly educated older adults. Non-detached dwellings with a garden (e.g. single family houses) are overrepresented in this cluster. These dwellings tend to be situated in neighbourhoods with a mixture of single households, families and older adults, relatively often located around the inner city area. The respondents in cluster 5 (i.e. Manifestation) can be characterized as highly educated couples without children (living at home). They tend to be owner-occupiers and tend to live in neighbourhoods where the other dwellings are also owner-occupied. Respondents living in detached dwellings are overrepresented in this cluster.

5.4.2. Housing preferences by motivational cluster

The housing preferences of older adults are analysed based on a carefully constructed questionnaire, which is designed as conjoint choice experiment. It involves confronting the respondents with a choice between several alternatives. In the present context, an alternative is a bundle of housing characteristics. A general characteristic is called an attribute and specific value of the characteristic is called an attribute level. An example of an attribute is the type of dwelling, with a possible attribute level being an apartment. In conjoint choice experiments, respondents indicate their preference by choosing the most preferred alternative or by ranking the alternatives from the most preferred to least preferred. The choices made reflect the preferences for certain characteristics of dwellings.

All respondents in our sample made a sequence of such choices. In our experiment, each choice refers to three alternative combinations of housing characteristics, one among them being the respondent's current dwelling. The respondents were asked to indicate the first and the second most preferred alternative, thereby revealing their complete preference orderings of the three. The small number of alternatives suggests the use of a discrete choice model as a suitable tool for analysis. Among such models the conditional logit model is the easiest to handle because of its closed form expression for the choice probabilities. The estimate results for the discrete choice models by motivational cluster are listed in Table 5.3.

Many of the explanatory variables listed in Table 5.3 are simply housing attributes that differ among the alternatives presented to the respondents. These variables are grouped into variables referring to housing characteristics and variables referring to the neighbourhood (i.e. living environment) characteristics. The choice of attributes is based on two criteria: importance and policy relevance, and reflects the agendas of housing associations in the Netherlands. Previous research, using these attributes, already revealed the presence of heterogeneity among Dutch older adults when stratifying the respondents by age (De Jong et al., 2012). The study demonstrated that the next generation of older adults is different from today's older adults. Future older adults have different expectations and abilities due to having

experienced expanded education opportunities, emancipation and participation (Kramer & Pfaffenbach, 2009). Therefore, they can be expected to have developed different lifestyles, which will likely lead them to favour different (residential) locations and different types of dwellings (Kramer & Pfaffenbach, 2009). The current study will reveal whether older adults not only differentiate themselves by age, but by motivational cluster as well.

For each motivational cluster we run two models. In the first model we use the attributes of the housing alternatives as the only determinants of the utility function. In the second model we also incorporate the effects of some of the individual characteristics. We predominately included education, in order to correct for a potential education effect. In addition we included an interaction effect regarding the presence of children, because it is conceivable that households with children living at home have other preferences with respect to the size of the dwelling than households without children. A log likelihood ratio test reveals that adding individual characteristics (i.e. interaction effects) results in a statistically significant improvement of the fit of the model.

Cluster 1: The estimated coefficient of the variable disposable income is highly significant. With this estimate we can compute the estimated willingness to pay for a particular housing attribute. The willingness to pay is the amount of money by which the disposable income can be reduced after including a particular housing attribute while keeping the consumer at the same utility level. The willingness to pay is the ratio of the coefficients of the particular housing attribute and disposable income. For example for model 1 the willingness to pay for having a say in the finishing of the dwelling equals 0.266/0.445 = 0.598. This implies that a having a say in the finishing would be worth approximately 60 euro per month. However, after controlling for a possible education effect, it becomes clear that the lower educated in this cluster do not share this preference. Since this cluster is characterized by a relatively large proportion of lower educated (women), the preference for having a say in the finishing of the dwelling of this cluster is therefore limited. The estimate results further reveal that the respondents in cluster 1 have the strongest preference for their current dwelling. Their inclination to their current type of dwelling is illustrated by their preference for (rental) apartments and for a dwelling in which the living room, kitchen, bathroom and at least one bedroom are located on the same floor. They also show a preference for dwellings accessible by elevator. Model 2, again, demonstrates that the lower educated in this model have a divergent preference pattern. The estimate results reveal that, when given a choice, the older adults in cluster 1 would prefer to live in a neighbourhood with a mixture of single households, families and older adults. Living with predominantly (other) older adults also has a significant effect on the evaluation of choice alternatives. This preference is strong compared to the other motivational clusters.

Table 5.3 Estimation results housing preferences by motivational cluster

	Cluster 1						Cluster 2					
	Model 1			Model 2			Model 3			Model 4		
	B	Sig.	S.E.	B	Sig.	S.E.	B	Sig.	S.E.	B	Sig.	S.E.
Disposable income (x100)	0.445	***	0.025	0.460	***	0.026	0.350	***	0.022	0.376	***	0.023
Current dwelling	1.993	***	0.049	2.015	***	0.050	1.896	***	0.050	1.916	***	0.051
Dwelling attributes												
Number of rooms	0.124		0.091	0.279		0.382	0.045		0.100	-0.730	***	0.253
Number of rooms x no children living at home				-0.135		0.381				0.914	***	0.266
Finishing	0.266	***	0.076	0.523	***	0.114	-0.056		0.078	0.160		0.122
Finishing x low educational level				-0.435	***	0.131				-0.453	***	0.149
Finishing x high educational level				-0.056		0.161				0.243		0.169
Home automation	0.072		0.075	-0.129		0.132	-0.140	*	0.078	0.031		0.123
Home automation x low educational level				0.080		0.146				-0.499	***	0.150
Home automation x high educational level				0.675	***	0.171				0.345	**	0.165
Type												
Detached	-0.279	**	0.139	-0.274	**	0.140	-0.102		0.143	-0.119		0.146
Non-detached, with garden	-0.529	***	0.089	-0.539	***	0.090	-0.816	***	0.103	-0.849	***	0.105
Non-detached, without garden	-0.978	***	0.107	-0.999	***	0.108	-1.095	***	0.127	-1.158	***	0.129
Apartment	ref.						ref.					
Tenure												
Rental dwelling	0.112	*	0.067	0.096		0.067	0.083		0.075	0.059		0.075
Owner-occupied	ref.						ref.					
Internal access												
Multiple floors	-0.908	***	0.062	-1.287	***	0.127	-0.844	***	0.066	-0.680	***	0.120
Multiple floors x low educational level				0.571	***	0.157				-0.306	**	0.156
Multiple floors x high educational level				0.334	*	0.182				-0.291		0.180
One floor	ref.						ref.					
External access												
Elevator	0.382	***	0.077	0.786	***	0.145	0.310	***	0.078	0.311	**	0.130
Elevator x low educational level				-0.451	***	0.173				0.063		0.174
Elevator x high educational level				-0.812	***	0.204				-0.382	**	0.192
Staircase	-1.025	***	0.087	-1.063	***	0.090	-0.843	***	0.091	-0.864	***	0.093
Staircase x low educational level				-0.087		0.057				0.329	***	0.073
Staircase x high educational level				0.234	**	0.109				-0.119		0.104
No elevator and/or staircase needed	ref.						ref.					
Neighbourhood attributes												
Tenure												
Mixture of owner-occupied and rental dwellings	0.023		0.098	0.011		0.099	0.228	**	0.099	0.185	*	0.100
Mainly rental dwellings	-0.063		0.105	-0.073		0.105	0.166		0.110	0.103		0.112
Mainly owner-occupied	ref.						ref.					
Neighbours												
Mixture of single households, families and older adults	0.410	***	0.092	0.410	***	0.092	0.475	***	0.094	0.507	***	0.094
Mainly older adults	0.263	**	0.105	0.276	***	0.105	-0.076		0.105	-0.012		0.106
Mainly families	ref.						ref.					
Location												
Around inner city	0.000		0.090	0.001		0.090	0.064		0.097	0.057		0.098
Edge of the city	-0.352	***	0.099	-0.356	***	0.099	-0.185	*	0.112	-0.193	*	0.113
Inner city	ref.						ref.					

Cluster 3						Cluster 4						Cluster 5					
Model 5			Model 6			Model 7			Model 8			Model 9			Model 10		
B	Sig.	S.E.	B	Sig.	S.E.	B	Sig.	S.E.	B	Sig.	S.E.	B	Sig.	S.E.	B	Sig.	S.E.
0.395	***	0.025	0.407	***	0.026	0.397	***	0.023	0.394	***	0.023	0.233	***	0.019	0.249	***	0.019
1.454	***	0.046	1.463	***	0.048	1.603	***	0.050	1.579	***	0.050	1.894	***	0.049	1.918	***	0.050
-0.120		0.090	0.175		0.258	0.273	***	0.092	-1.124	**	0.469	0.142		0.108	1.548	***	0.304
			-0.317		0.268				1.470	***	0.470				-1.466	***	0.310
-0.032		0.078	-0.044		0.130	0.216	***	0.080	-0.006		0.183	0.175	**	0.080	0.102		0.133
			-0.169		0.161				0.215		0.301				-0.546	**	0.238
			0.218		0.150				0.282		0.191				0.258	*	0.151
-0.283	***	0.080	-0.116		0.125	-0.106		0.082	-0.248		0.168	0.078		0.080	-0.015		0.141
			-0.482	***	0.168				0.756	*	0.393				-0.358		0.264
			0.011		0.153				0.085		0.177				0.210		0.157
0.170		0.139	0.170		0.140	0.580	***	0.144	0.563	***	0.145	0.026		0.164	0.011		0.166
-0.434	***	0.089	-0.440	***	0.089	-0.009		0.102	-0.013		0.103	-0.673	***	0.116	-0.703	***	0.117
-0.731	***	0.104	-0.743	***	0.104	-0.751	***	0.125	-0.769	***	0.125	-1.056	***	0.135	-1.093	***	0.135
ref.						ref.						ref.					
0.173	***	0.064	0.162	**	0.065	-0.083		0.071	-0.081		0.071	-0.564	***	0.076	-0.578	***	0.077
ref.						ref.						ref.					
-0.807	***	0.069	-0.948	***	0.127	-0.500	***	0.066	-0.579	***	0.171	-0.742	***	0.071	-0.831	***	0.153
			0.118		0.180				-0.456		0.417				0.261		0.261
			0.262		0.167				0.164		0.187				0.129		0.176
ref.						ref.						ref.					
-0.035		0.076	0.063		0.137	-0.292	***	0.090	0.292		0.211	0.083		0.084	0.499	***	0.153
			0.114		0.187				-0.881	*	0.527				0.338		0.344
			-0.318	*	0.177				-0.544	**	0.230				-0.593	***	0.181
-0.963	***	0.088	-0.960	***	0.089	-1.196	***	0.097	-1.179	***	0.098	-0.900	***	0.096	-0.887	***	0.098
			0.051		0.078				0.674	***	0.237				-0.332	**	0.163
			-0.091		0.074				-0.247	***	0.064				-0.054		0.062
ref.						ref.						ref.					
0.197	**	0.095	0.180	*	0.095	-0.011		0.111	-0.003		0.111	-0.260	***	0.119	-0.279	**	0.120
0.031		0.107	0.007		0.107	-0.457	***	0.120	-0.472	***	0.121	-0.670	***	0.121	-0.705	***	0.122
ref.						ref.						ref.					
0.380	***	0.090	0.390	***	0.090	0.631	***	0.100	0.650	***	0.101	0.327	***	0.104	0.352	***	0.105
0.194	*	0.103	0.216	**	0.104	0.056		0.117	0.085		0.118	0.148		0.112	0.185	*	0.112
ref.						ref.						ref.					
-0.104		0.093	-0.108		0.093	0.146		0.098	0.148		0.098	0.034		0.100	0.032		0.100
0.040		0.098	0.042		0.099	-0.203	*	0.120	-0.201	*	0.120	-0.256	*	0.130	-0.249	*	0.132
ref.						ref.						ref.					

Table 5.3 Continued

	Cluster 1						Cluster 2					
	Model 1			Model 2			Model 3			Model 4		
	B	Sig.	S.E.	B	Sig.	S.E.	B	Sig.	S.E.	B	Sig.	S.E.
Daily supplies												
Walking distance	0.805	***	0.117	0.952	***	0.214	0.857	***	0.116	1.066	***	0.212
Walking distance x low educational level				-0.212		0.271				-0.194		0.273
Walking distance x high educational level				-0.134		0.309				-0.361		0.306
Cycling distance	0.219	*	0.119	0.205		0.200	0.105		0.117	0.217		0.187
Cycling distance x low educational level				-0.104		0.270				-0.377		0.262
Cycling distance x high educational level				0.298		0.293				0.276		0.301
Driving distance	ref.						ref.					
Care facilities												
Walking distance	0.457	***	0.119	0.436	**	0.208	0.431	***	0.114	0.676	***	0.207
Walking distance x low educational level				0.302		0.264				-0.325		0.263
Walking distance x high educational level				-0.557	*	0.320				-0.372		0.303
Cycling distance	0.000		0.112	-0.069		0.195	-0.151		0.110	-0.123		0.172
Cycling distance x low educational level				0.227		0.257				-0.190		0.247
Cycling distance x high educational level				-0.156		0.290				0.177		0.288
Driving distance	ref.						ref.					
Public transport												
Good access	1.245	***	0.106	1.148	***	0.184	0.929	***	0.103	1.046	***	0.170
Good access x low educational level				0.218		0.235				0.059		0.235
Good access x high educational level				-0.004		0.272				-0.348		0.267
Poor access	ref.						ref.					
Log likelihood	-6027.74			-5988.34			-5410.62			-5334.10		
n	222			222			197			197		

***Significant at 0.01 level; **significant at 0.05 level; *significant at 0.1 level.

Cluster 2: The estimate results of model 4 reveal that the older adults without children (living at home) within this cluster show a preference for a larger dwelling. Considering this cluster has a relatively large share of couples without children (living at home), the preference for a larger dwelling is a noteworthy result. Model 4 further demonstrates that the lower educated in this cluster dislike having to pay for 'luxuries' such as having a say in this finishing and the presence of home automation designed to increase the comfort and safety of the dwelling (which makes it possible for older people or people with disabilities to remain at home, safe and comfortable). In general, they show a strong disliking towards non-detached houses. Given a choice, they would prefer to live in an apartment. This preference is further illustrated by their desire to live in a dwelling in which the living room, kitchen, bathroom and at least one bedroom are located on the same floor (no education effect in this cluster). The majority of respondents in this cluster are presently living in neighbourhoods with predominantly (other) families, when given a choice they would rather live in a neighbourhood with a mixture of single households, families and older adults.

	Cluster 3						Cluster 4						Cluster 5					
	Model 5			Model 6			Model 7			Model 8			Model 9			Model 10		
	B	Sig.	S.E.	B	Sig.	S.E.	B	Sig.	S.E.	B	Sig.	S.E.	B	Sig.	S.E.	B	Sig.	S.E.
	0.612	***	0.100	0.019		0.180	1.021	***	0.126	0.937	**	0.397	0.747	***	0.126	0.341		0.266
				0.641	**	0.257				0.164		0.595				0.103		0.496
				1.227	***	0.242				0.139		0.419				0.616	**	0.304
	0.223	*	0.116	-0.007		0.216	0.485	***	0.124	-0.283		0.388	0.091		0.130	-0.375		0.295
				-0.121		0.298				1.531	**	0.741				-0.336		0.575
				0.881	***	0.282				0.877	**	0.409				0.765	**	0.328
	ref.						ref.						ref.					
	0.222	**	0.104	-0.450	**	0.181	0.494	***	0.119	0.798	**	0.349	0.291	***	0.123	-0.024		0.259
				1.000	***	0.268				-0.597		0.564				0.132		0.454
				1.154	***	0.251				-0.291		0.371				0.481		0.295
	0.027		0.104	-0.367	*	0.196	0.065		0.116	-0.095		0.313	-0.080		0.116	-0.344		0.248
				0.289		0.281				0.332		0.831				-0.215		0.518
				0.954	***	0.252				0.195		0.334				0.425		0.280
	ref.						ref.						ref.					
	0.908	***	0.090	0.828	***	0.163	1.026	***	0.103	1.225	***	0.274	0.965	***	0.114	0.791	***	0.249
				0.181		0.228				-0.275		0.560				-0.487		0.443
				0.246		0.214				-0.174		0.294				0.364		0.281
	ref.						ref.						ref.					
	-5900.82			-5846.67			-4836.52			-4797.75			-4596.33			-4555.31		
	192			192			162			162			161			161		

Cluster 3: The estimate results of this cluster reveal that the respondents in this group have a strong dislike towards the presence of home automation in their dwelling. The results of model 6 illustrate that, when controlled for education, this inclination is not significant anymore. The coefficient is, however, very significant (and negative) for the lower educated in this group. This illustrates that home automation is not considered to be an attractive housing attribute for a rather large group of older adults in this cluster. At present, the respondents in this cluster tend to live in rental apartments, with a relatively large portion accessible by a staircase. When given a choice, the respondents in this cluster would prefer to live in a rental apartment again, but they would not choose a dwelling which requires access by a staircase.

Cluster 4: The estimate results of model 7 and 8 show that, in contrast to the other clusters, the respondents in this cluster prefer to live in a detached dwelling. The estimate results further reveal that they have a preference for dwellings in which the living room, kitchen, bathroom and at least one bedroom are located on the same floor, with access at street level. Based on these findings, it is conceivable that the respondents in cluster 4 show a

preference for dwellings which are considered to be more accessible than their current type of dwelling (i.e. single family homes are overrepresented in this cluster), such as a bungalow. This does, however, not necessarily imply that they prefer a smaller dwelling.

Cluster 5: The estimate results for this cluster demonstrate that the respondents in cluster 5 are willing to pay the most for having a say in the finishing of their dwelling. Based on the ratio of the coefficients of finishing and disposable income, the willingness to pay equals (0.175/0.233) = 0.7510. This implies that a having a say in the finishing would be worth 75 euro per month. This is in accordance to the fact that this is the most affluent cluster, in terms of their average net monthly income. The estimate results of model 9 and 10 further show a strong preference for owner-occupied dwellings. When given a choice, the respondents in this cluster would prefer an apartment over a detached dwelling. In contrast to the other clusters, the estimate results for cluster 5 reveal a strong preference for neighbourhoods with predominantly (other) owner-occupied dwellings.

Even though the estimate results for the different motivational clusters reveal heterogeneous preference patterns, we do find some strong similarities. All clusters show a strong preference for their current dwelling (i.e. not moving). In addition, all dislike non-detached dwellings (either with or without a garden) and dwellings in which the living room, kitchen, bathroom, and at least one bedroom are located on multiple floors. With regard to their living environment, all clusters show a strong preference for neighbourhoods with a mixture of single households, families and older adults. This neighbourhood should not be located at the edge of the city. All clusters prefer to have amenities (i.e. daily supplies, care facilities and public transport) in the vicinity (i.e. walking distance) of their home. Clearly, the preference for these particular housing attributes is generic among the older adults in our sample and not dependent on their lifestyle.

5.5. Conclusion

In recent decades, Western society has become increasingly complex due to demographic, socio-economic and socio-cultural shifts (Jansen, 2012). Most probably as a result, residential preferences have become more dynamic and differentiated (Heijs et al., 2009). For this reason, researchers and local governments have argued that traditional, socio-demographic variables no longer suffice as a basis for policy and planning in the housing sector. In search of alternative procedures to match supply and demand, several approaches that are derived from marketing have been introduced. One of these is the concept of lifestyles. Over the last decades the development and use of lifestyle

typologies in housing research has grown tremendously and lifestyle typologies are given widespread attention in the domain of housing research (Jansen, 2011). It has been argued that lifestyles supplement traditional variables by adding to a better description and prediction of demand and of relations with the supply side (De Jong, 1996; Floor & Van Kempen, 1994; Hooimeijer, 1994; Van Diepen & Musterd, 2001).

The matching of housing demand and housing supply for older adults is of particular interest since it has been estimated that in the Netherlands there is a shortage of 373,000 houses suitable for older adults for the period 2012 to 2021 (Van Galen & Faessen, 2014). This estimate is based on the current shortage, the expected extra demand due the ageing of the Dutch population, as well as the expected extra demand due to the fact that more and more older adults prefer to 'age in place' (e.g. on an extramural basis). For the supply of appropriate housing for older adults, the Dutch government relies on the construction of so-called 'zero-steps dwellings' (i.e. single-storey houses) (Van Iersel et al., 2010), without paying much attention to the specific wishes for housing that might vary widely within the age group these houses are built for.

Often, an accurate understanding of the senior market is lacking, which increases the risk of ageism and stereotyping (Carrigan & Szmigin, 2000). 'The older adult' as such does not exist, making segmentation in more or less homogeneous groups essential. The current study uses a lifestyle segmenting approach to determine meaningful segments in the Dutch senior market. The concept of lifestyle is operationalized in terms of values, using the BSR framework. This results in the identification of five psychographic segments of older adults (i.e. motivational clusters) who have (more or less) the same viewpoints, motivations and attitude with respect to housing. The finding of these segments captures well the difference in aspirations, feelings, perception and motivations among older adults. It demonstrates both the existence of a generic housing preference as well as the existence of significant differences, particularly with regard to the desired dwelling attributes.

Although lifestyles do not represent clear-cut categories of people, but analytically derived ideal types (Gustafson, 2001), the results of the conditional logit model do support the premise that lifestyle has a significant influence on preferred housing attributes. For policy, this implies that generalized housing policies for older adults (such as ascribed above) will become more and more ineffective and inefficient (Hooimeijer, 2007). For housing research, the heterogeneity in housing preferences among older adults clearly indicates that prognoses based on averages per age cohort will become less and less meaningful for the whole population of older adults. Since the study finds clear evidence for heterogeneity of Dutch older adults, future researchers may compare the results of this study with those of different countries.

The exposed heterogeneity among older adults and the associated differences in housing preferences, are relevant for a wide range of institutions and actors. Policy makers, for example, would benefit from studies further detailing the heterogeneity of older adults on the housing market. Aside from the apparent differences in housing preferences, one could assume older adults in the housing market are also differentiated when looking at their willingness to make use of housing equity, residential moving behaviour, social support needs and so on. Furthermore, with taking heterogeneous housing preferences as a starting point in developing differentiated housing supply, the ageing in place concept might be more successful. Policy should focus more on participatory decision-making, where the heterogeneous preferences and demands from older adults can help in co-creating the policies concerning the provision of (suitable) housing, both for the short and the long term.

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References

Abramsson, M., & Andersson, E. (2016). Changing Preferences with Ageing: Housing Choices and Housing Plans of Older People. *Housing, Theory and Society, 33*(2), 217-241. https://doi.org/10.1080/14036096.2015.1104385

Anderson, W.T., & Golden, L.L. (1984). Lifestyle and psychographics: A critical review and recommendation. In T.C. Kinnear (Ed.), *Advances in consumer research* (pp. 405-411). Association for Consumer Research.

Banfield, J.D., & Raftery, A.E. (1993). Model Based Gaussian and Non-Gaussian Clustering. *Biometrics, 49*(3), 803-821. https://doi.org/10.2307/2532201

Beatty, S.E., Kahle, L.R., Homer, P., & Misra, S. (1985). Alternative measurement approaches to consumer values: the List of Values and the Rokeach Value Survey. *Psychology & Marketing*, *2*(3), 181-200. https://doi.org/10.1002/mar.4220020305

Bensmail, H., Celeux, G., Raftery, A.E., & Robert, C.P. (1997). Inference in Model Based Clustering. *Statistics and Computing, 7*(1), 1-10. https://doi.org/10.1023/A:1018510926151

Bettman, J.R. (1979). *An Information Processing Theory of Consumer Choice.* Addison-Wesley.

Bijker, R.A., Haartsen, T., & Strijker, D. (2012). Different Areas, Different People? Migration to Popular and less-Popular Rural Areas in the Netherlands. *Population, Space and Place, 19*(5), pp. 580–593. https://doi.org/10.1002/psp.1741

Brethouwer, W., Lamme, A., Rodenburg, J., Du Chatinier, H., & Smit, M. (1995). *Quality Planning toegepast* [Quality Planning applied]. Janssen Offset.

Callebaut, J., Janssens, M., Op de Beeck, D., Lorré, D., Hendrickx, H., & Gaus, H. (1999). *Motivational Marketing Research Revisted.* Garant Publishers.

Carrigan, M., & Szmigin, I. (2000). Advertising in an ageing society. *Ageing and Society, 20*(2), 217-233. https://doi.org/10.1017/S0144686X99007709

Christensen, K., Doblhammer, G., Rau, R., & Vaupel, J.W. (2009). Ageing populations: the challenges ahead. *The Lancet, 374*(9696), 1196-1208. https://doi.org/10.1016/S0140-6736(09)61460-4

Day, E., Davis, B., Dove, R., & French, W. (1988). Reaching the senior citizen market(s). *Journal of Advertising Research, 27*(6), 23-30.

De Jong, F. (1996). *Woonvoorkeuronderzoek: Theorie, Empirie en Relevantie voor de Praktijk. Woonconsument en Woningkwaliteit 5* [Housing preferences research: theory, empirics, and relevance for practice]. Technische Universiteit Delft, Faculteit Bouwkunde.

De Jong, P.A., Rouwendal, J., Van Hattum, P., & Brouwer A.E. (2012). *Housing Preferences of an Ageing Population. Investigation in the Diversity Among Dutch Older Adults* (Netspar Discussion Papers 07/2012-024). Network for Studies on Pensions, Aging and Retirement.

Dempster, A.P., Laird, N.M., & Rubin, D.B. (1977). Maximum Likelihood from Incomplete Data via the EM Algorithm. *Journal of the Royal Statistical Society, Series B, 39*(1), 1-38. https://www.jstor.org/stable/2984875

Droogleever Fortuijn, J., Van der Meer, M., Burholt, V., Ferring, D., Quattrini, S., Rahm Hallberg, I., Weber, G., & Wenger, G.C. (2006). The Activity Patterns of older Adults: A Cross-Sectional Study in Six European Countries. *Population, Space and Place, 12*(5), 353-369. https://doi.org/10.1002/psp.422

Floor, H., & Van Kempen, R. (1994). *Wonen op Maat: Een Onderzoek naar de Voorkeuren en Motieven van Woonconsumenten en te Verwachten Ontwikkelingen daarin. Deel 1: Theoretische Uitgangspunten en Probleemstelling* [Custom-made housing: a research on the preferences and motives of housing consumers and expected future developments]. Faculteit Ruimtelijke Wetenschappen, Universiteit Utrecht.

Fox, R., & French, W.A.(1985). Segmenting the Senior Citizen Market. *The Journal of Consumer Marketing, 2*(1), 61-74. https://doi.org/10.1108/eb038822

Fraley, C., & Raftery, A.E. (1998). *How Many Clusters? Which Clustering Method? Answers via Model Based Cluster Analysis* (Technical Report No. 329). University of Washington, Department of Statistics.

Ganzeboom, H. (1988). *Leefstijlen in Nederland. Een verkennende studie* [Lifestyles in The Netherlands. An exploratory study] (Cahier no. 60). Sociaal en Cultureel Planbureau.

Gollub, J., & Javitz, H. (1989). Six ways to age. *American Demographics, 11*(6), 28-57.

Gunter, B. (1998). *Understanding the older consumer*. Routledge.

Gunter, B., & Furnman, A. (1992). *Consumer profiles. An introduction to psychographics.* Routledge.

Gustafson, P. (2001). Retirement migration and transnational lifestyles. *Ageing and Society, 21*(4), 371-394. https://doi.org/10.1017/S0144686X01008327

Haberman, S.J. (1988). A Stabilized Newton-Raphson Algorithm for Log-Linear Models for Frequency Tables derived by Indirect Observations. *Sociological Methodology, 18*, 193-221. https://doi.org/10.2307/271049

Hair, J.F., Anderson, R.E., Tatham, R.L., & Black, W.C. (1984). *Multivariate Data Analysis* Prentice-Hall International.

Heijs, W., Carton, M., Smeets, J,. & Van Gemert, A. (2009). Labyrinth of life-styles. *Journal of housing and the Built Environment, 24*(3), 347-356. https://doi.org/10.1007/s10901-009-9147-z

Heijs, W., Van Deursen, A.M., Leussink, M., & Smeets, J. (2011). Re-searching the labyrinth of life-styles. *Journal of Housing and the Built Environment, 26*(4), 411-425. https://doi.org/10.1007/s10901-011-9237-6

Hesse, W. (1991). *Changes with the over 50's lead to changes in society and economy in the next three decades*. ESOMAR: Papers on the Over 50's in the 90's: Factors for Successful Marketing of Products and Services.

Hoijtink, H., & Notenboom, A. (2004). Model Based Clustering of Large Data Sets: Tracing the Development of Spelling Ability. *Psychometrika, 69*(3), 481-498. https://doi.org/10.1007/BF02295648

Hooimeijer, P. (1994). Hoe meet je woonwensen? Methodologische haken en ogen [How to measure housing preferences? Methodological complications]. In I. Smid, & H. Priemus (Eds.), *Bewonerspreferenties: Richtsnoer voor Investeringen in Nieuwbouw en de Woningvoorraad* (pp. 3-12). Delftse Universitaire Pers.

Hooimeijer, P. (2007). *Dynamiek in de derde leeftijd: de consequenties voor het woonbeleid* [Dynamics in life's third act: consequences for housing policy]. Ministerie van VROM.

Jansen, S.J.T. (2011). Lifestyle Method. In S.J.T. Jansen, H.C.C.H Coolen, & R.W. Goetgeluk (Eds.), *The Measurement and Analysis of Housing Preference and Choice* (pp 177-202). Springer.

Jansen, S.J.T. (2012). What is the worth of values in guiding residential preferences and choices? *Journal of Housing and the Built Environment, 27*(3), 273-300. https://doi.org/10.1007/s10901-012-9270-0

Kim, S. (2011). Intra-regional residential movement of the elderly: testing a suburban-to-urban migration hypothesis. *Annals of Regional Science, 46*(1), 1-17. https://doi.org/10.1007/s00168-009-0325-4

Kramer, C., & Pfaffenbach, C. (2009). Persistence preferred- on future residential (im)mobility among the generation 50plus, *ERDKUNDE, 63*(2), 161-172. https://doi.org/10.3112/erdkunde.2009.02.04

Michelson, W., & Reed, P. (1975). Lifestyle in environmental research. In C. Beattie & S. Crysdale (Eds.), *Sociology Canada: Readings* (pp. 406-419). Butterworths.

Moschis, G.P. (1993). Gerontographics: A scientific approach to analysing and targeting the mature market, *The Journal of Consumer Marketing, 10*(3), 43-54.

Moschis, G.P. (1996). *Gerontographics, Life-stage segmentation for marketing strategy development*. Quorum Books.

Moschis, G.P., Bellenger, D., & Folkman Curasi, C. (2003, January 25-28). *Housing preferences of older consumers* [Conference presentation]. Annual Conference of the Pacific Rim Rea Estate Society, Bangkok Thailand.

Newcomb, S. (1886). A Generalized Theory of the Combination of Observations So As To Obtain the Best Result. *American Journal of Mathematics, 8*(4) 343-366. https://doi.org/10.2307/2369392

Oppenhuisen, J. (2000). *Een schaap in de bus? Een onderzoek naar waarden van de Nederlander* [A sheep on a bus? A research on the values of the Dutch] [Doctoral dissertation, University of Amsterdam].

Pearson, K. (1894). Contributions to the Mathematical Theory of Evolution. *Philosophical Transactions of the Royal Society of London A, 185*(1894), 71-110. https://doi.org/10.1098/rsta.1894.0003

Pinkster, F., & Van Kempen, R. (2002). *Leefstijlen en Woonmilieuvoorkeuren* [Lifestyles and living environment preferences]. University of Utrecht, Urban and Regional Research Centre.

Rokeach, M.J. (1973). *The Nature of Human Values*. Free Press.

Sorce, P., Tyler, P.R., & Loomis, L.M. (1989). Lifestyles of Older Americans. *Journal of Consumer Marketing, 6*(3), 53-63. https://doi.org/10.1108/EUM0000000002555

Systeem woningvoorraad. (2016). *Stand woningvoorraad 2015*. Ministerie van Binnenlandse Zaken en Koninkrijksrelaties. https://syswov.datawonen.nl/

Ter Braak, C.J.F., Hoijtink, H., Akkermans, W., & Verdonschot, P.F.M. (2003). Bayesian Model Based Cluster Analysis for Predicting Macrofaunal Communities. *Ecological Modeling, 160*(3), 235-248. https://doi.org/10.1016/S0304-3800(02)00256-9

Tréguer, J.P. (1998). *Le senior marketing* (2nd ed.). Dunod.

Van Diepen, A.M.L., & Arnoldus, M. (2003). *De woonvraag in de vraaggestuurde markt. Bouwstenen uit het woonmilieuanalyse en leefstijlenonderzoek* [Housing demand in the demand-driven market. Building blocks from the living environment analysis and lifestyle research] (Rapport 23). DGW/ Nethur partnership.

Van Diepen, A.M.L., & Musterd, S. (2001). *Stedelijke Leefstijlen en Woonmilieus in Amsterdam* [Urban Lifestyles and Living Environments in Amsterdam]. Amsterdam Study Centre for the Metropolitan Environment.

Van Dijk, H.M., Cramm, J.M., Lötters, F., & Nieboer, A. (2013). *Even buurten: een wijkgerichte aanpak voor thuiswonende ouderen in Rotterdam* [a neighborhood approach for older adults ageing in place in Rotterdam] (SMW 2013-10). Erasmus Universiteit Rotterdam.

Van Galen, J., & Faessen, W. (2014). *Herziening Monitor Investeren voor de Toekomst* [Review of the Monitor Investing for the Future]. ABF Research.

Van Hattum, P., & Hoijtink H. (2009). Market Segmentation using Brand Strategy Research: Bayesian Inference with respect to Mixtures of Log-Linear Models, *Journal of Classification, 26*(3), 297–328. https://doi.org/10.1007/s00357-009-9040-1

Van Hattum, P., & Hoijtink H. (2010). Reducing the optimal to a useful number of clusters for model-based clustering. *Journal of Targeting Measurement and Analysis for Marketing, 18*(2), 139-154. https://doi.org/10.1057/jt.2010.6

Van Iersel, J., Leidelmeijer, K., & Buys, A. (2010). *Senioren op de woningmarkt: nieuwe generaties, andere eisen en wensen* [Seniors in the housing market: new generations, different requirements and preferences]. Ministerie van VROM.

Vermunt, J.K., & Magidson, J. (2000). *Latent Gold*. Statistical Innovations Inc.

Wedel, M., & Kamakura, W.A. (2000). *Market Segmentation: Conceptual and Methodological Foundations*. Kluwer Academic Publishers.

Weijters, B., & Geuens, M. (2003). *Segmenting the Senior Market: Professional and Social Activity Level* (Vlerick Working Papers 2003/03). Vlerick Leuven Gent Management School.

Wells, W. (1974). *Life-style and psychographics*. American Marketing Association.

Wilkes, R.E. (1992). A Structural Modelling Approach to The Measurement and Meaning of Cognitive Age. *Journal of Consumer Research, 19*(2), 292-301. https://doi.org/10.1086/209303

Wulff, M., Champion, A., & Lobo, M. (2010). Household diversity and migration in Mid-life: Understanding Residential Mobility among 45-64 Year Olds in Melbourne, Australia. *Population, Space and Place, 16*(4), 307-321. https://doi.org/10.1002/psp.553

Appendices

Appendix 5.1 BSR questionnaire [translated from Dutch]

Question 1: Which character traits fit you best? (Max. 7 picks)

- A little bit shy
- Adventurous
- Capable
- Cosy
- Energetic
- A little bit imprudent
- Honest
- Jovial
- Opinionated
- Self-assured
- Serious
- Spontaneous
- A Little impatient
- Assertive
- Cheerful
- Critical
- Enthusiastic
- Gentle
- Intelligent
- Sympathetic
- Ordinary
- Self-confident
- Down-to-earth
- Strong character
- Easy going
- Balanced
- Classy
- Deliberate
- Leader
- Helpful
- Interested in others
- Neat
- Passionate
- Serene
- Commercial

Question 2: Which family or household types fit you best? (Max. 3 picks)

- A family where everyone goes their own way
- Bachelor
- Busy, dynamic family
- Happy family
- Ideal family
- Not suited for family life
- Peaceful family
- Single
- Stable family
- Striving for a family
- Artistic household
- Broad-minded family
- Cosy old-fashioned family
- Harmonious family
- Isolated family
- Perfect family
- Rigid family
- Sportive family
- Dignified household
- Warm family

Question 3: Which occupations appeal to you most? Mind: you do not have to practice the occupation(s) that you pick (anymore). (Max. 7 picks)

- Account manager
- Member of the board
- Commercial assistant
- E-Business
- Freelancer
- Journalist
- No occupation
- Photographer
- Programmer
- Secretary
- Shop assistant
- Sports teacher
- Temporary employee
- Activity guide
- Businessman/-woman
- Commissioner
- Entrepreneur
- Fulltime housewife
- Male nurse
- Nurse
- Artist
- Project manager
- Scientist
- Shopkeeper
- Student
- Truck driver
- Volunteer
- Beautician
- Social worker
- Designer
- Financial planner
- Househusband
- Manager
- Part-time housewife/-husband
- Anchor man
- Public servant
- Vets assistant
- Relief worker
- Stylist
- Unemployed

Question 4: Which hobbies, interests and/or leisure activities fit you best? (Max 5 picks)

- A sociable evening with friends
- Turning in a top-notch achievement
- Build a successful career
- Classy parties
- Doing odd jobs around the house
- Going to a discothèque
- Making dreams come true
- Playing chess
- Visiting friends and relatives
- Watching TV
- Active sports
- Astrology
- Camping
- Going on an outing
- Gardening
- Golf
- Religious matters
- Reading (magazines)
- Squashing
- Team sports
- Adventurous holidays
- Being at home quietly
- Cars/ motorbikes
- Dining out together
- Going out together

- Investing in stocks
- Swimming
- Shopping
- Surfing the internet
- Visiting a pub
- Snowboarding

Question 5: Which values fit you best? (Max. 6 picks)

- Anonymity
- Enthusiasm
- Heroism, glory
- Passion
- Recognition of performances
- Self-belief
- Social harmony
- Success in life
- Challenge, stimulation
- Expression, uniqueness
- Independence
- Privacy, tranquillity
- Respect
- Self-fulfilment, growth
- Solidarity
- Enjoyable life
- Friendship
- Intimacy
- Rationality
- Security
- Social alliance
- Status

Appendix 5.2 Remaining Cluster Specific Item Probabilities for the $Q = 6$ Solution. P36=$P36(x_{i36}=1|\tau_i=q)$,..., $P148(x_{i148}=1|\tau_i=q)$.

q		1	2	3	4	5	6
ω_q		0.240	0.211	0.200	0.172	0.168	0.010
P36	A family where everyone goes their own way	0.054	0.086	0.085	0.146	0.096	0.100
P37	Bachelor	0.142	0.033	0.231	0.170	0.066	0.500
P38	Busy, dynamic family	0.033	0.057	0.025	0.140	0.102	0.100
P39	Happy family	0.134	0.424	0.101	0.064	0.293	0.100
P40	Ideal family	0.013	0.019	0.005	0.000	0.042	0.000
P41	Not suited for family life	0.029	0.000	0.136	0.082	0.018	0.200
P42	Peaceful family	0.255	0.324	0.372	0.088	0.323	0.100
P43	Single	0.494	0.086	0.432	0.497	0.210	0.400
P44	Stable family	0.360	0.310	0.271	0.152	0.395	0.100
P45	Striving for a family	0.004	0.000	0.015	0.006	0.006	0.000
P46	Artistic household	0.017	0.029	0.045	0.374	0.024	0.000
P47	Broad-minded family	0.192	0.252	0.131	0.374	0.329	0.500
P48	Cosy old-fashioned family	0.126	0.233	0.055	0.029	0.078	0.000
P49	Harmonious family	0.134	0.224	0.116	0.129	0.246	0.200
P50	Isolated family	0.004	0.000	0.045	0.012	0.000	0.000
P51	Perfect family	0.004	0.024	0.025	0.000	0.030	0.000
P52	Rigid family	0.000	0.000	0.005	0.006	0.000	0.000
P53	Sportive family	0.063	0.267	0.035	0.076	0.180	0.100
P54	Dignified household	0.008	0.000	0.010	0.000	0.012	0.000
P55	Warm family	0.280	0.438	0.050	0.146	0.174	0.100
P56	Account manager	0.008	0.100	0.020	0.012	0.126	0.000
P57	Member of the board	0.008	0.033	0.005	0.070	0.269	0.000
P58	Commercial assistant	0.029	0.138	0.025	0.023	0.138	0.200
P59	E-Business	0.000	0.014	0.030	0.064	0.036	0.000
P60	Freelancer	0.042	0.043	0.146	0.228	0.180	0.100
P61	Journalist	0.042	0.033	0.116	0.257	0.096	0.100
P62	No occupation	0.075	0.029	0.166	0.029	0.030	0.000
P63	Photographer	0.109	0.105	0.186	0.310	0.054	0.700
P64	Programmer	0.025	0.057	0.101	0.053	0.042	0.000
P65	Secretary	0.159	0.024	0.015	0.018	0.042	0.100
P66	Shop assistant	0.100	0.067	0.045	0.012	0.006	0.000
P67	Sports teacher	0.025	0.205	0.015	0.099	0.054	0.100
P68	Temporary employee	0.033	0.024	0.065	0.012	0.030	0.000
P69	Activity guide	0.197	0.195	0.030	0.076	0.036	0.500
P70	Businessman/-woman	0.063	0.100	0.040	0.070	0.299	0.000

Appendix 5.2 Continued

q		1	2	3	4	5	6
ω_q		0.240	0.211	0.200	0.172	0.168	0.010
P71	Commissioner	0.000	0.000	0.010	0.006	0.084	0.000
P72	Entrepreneur	0.025	0.219	0.065	0.181	0.323	0.000
P73	Fulltime housewife	0.326	0.048	0.065	0.006	0.006	0.000
P74	Male nurse	0.054	0.110	0.040	0.012	0.018	0.000
P75	Nurse	0.301	0.081	0.045	0.058	0.018	0.000
P76	Artist	0.092	0.043	0.126	0.526	0.042	0.400
P77	Project manager	0.013	0.186	0.080	0.170	0.299	0.100
P78	Scientist	0.029	0.071	0.161	0.316	0.269	0.100
P79	Shopkeeper	0.071	0.148	0.035	0.000	0.108	0.000
P80	Student	0.000	0.005	0.015	0.041	0.054	0.100
P81	Truck driver	0.021	0.129	0.075	0.018	0.030	0.100
P82	Volunteer	0.322	0.314	0.191	0.234	0.078	0.100
P83	Beautician	0.109	0.019	0.005	0.006	0.012	0.100
P84	Social worker	0.343	0.271	0.030	0.199	0.060	0.100
P85	Designer	0.109	0.090	0.080	0.316	0.060	0.400
P86	Financial planner	0.004	0.100	0.055	0.000	0.120	0.000
P87	Househusband	0.004	0.248	0.151	0.088	0.012	0.200
P88	Manager	0.033	0.181	0.085	0.146	0.605	0.000
P89	Part-time housewife/-husband	0.209	0.138	0.111	0.146	0.102	0.000
P90	Anchor man	0.021	0.024	0.005	0.111	0.120	0.100
P91	Public servant	0.096	0.152	0.211	0.076	0.180	0.000
P92	Vets assistant	0.117	0.010	0.035	0.023	0.006	0.000
P93	Relief worker	0.372	0.286	0.085	0.316	0.120	0.600
P94	Stylist	0.130	0.010	0.005	0.070	0.000	0.400
P95	Unemployed	0.025	0.014	0.080	0.035	0.006	0.100
P96	A sociable evening with friends	0.343	0.305	0.075	0.339	0.317	0.200
P97	Turning in a top-notch achievement	0.000	0.005	0.005	0.018	0.048	0.000
P98	Build a successful career	0.000	0.000	0.000	0.012	0.084	0.200
P99	Classy parties	0.000	0.005	0.000	0.000	0.036	0.000
P100	Doing odd jobs around the house	0.126	0.310	0.201	0.140	0.228	0.200
P101	Going to a discothèque	0.000	0.005	0.005	0.000	0.000	0.000
P102	Making dreams come true	0.050	0.024	0.020	0.187	0.054	0.200
P103	Playing chess	0.004	0.048	0.050	0.029	0.054	0.000
P104	Visiting friends and relatives	0.251	0.114	0.075	0.053	0.084	0.000
P105	Watching TV	0.456	0.419	0.503	0.211	0.246	0.200
P106	Active sports	0.079	0.195	0.070	0.193	0.353	0.100

Appendix 5.2 Continued

q		1	2	3	4	5	6
ω_q		0.240	0.211	0.200	0.172	0.168	0.010
P107	Astrology	0.054	0.005	0.010	0.070	0.000	0.200
P108	Camping	0.046	0.229	0.131	0.246	0.156	0.000
P109	Going on an outing	0.423	0.319	0.211	0.234	0.228	0.400
P110	Gardening	0.276	0.281	0.161	0.339	0.144	0.200
P111	Golf	0.008	0.024	0.005	0.023	0.126	0.100
P112	Religious matters	0.113	0.005	0.070	0.094	0.048	0.000
P113	Reading (magazines)	0.435	0.129	0.332	0.544	0.317	0.000
P114	Squashing	0.000	0.014	0.005	0.000	0.000	0.000
P115	Team sports	0.004	0.129	0.030	0.058	0.042	0.000
P116	Adventurous holidays	0.075	0.190	0.116	0.327	0.216	0.300
P117	Being at home quietly	0.498	0.305	0.573	0.392	0.365	1.000
P118	Cars/ motorbikes	0.008	0.114	0.060	0.012	0.132	0.100
P119	Dining out together	0.456	0.433	0.201	0.339	0.437	0.700
P120	Going out together	0.138	0.205	0.070	0.193	0.174	0.200
P121	Investing in stocks	0.004	0.029	0.030	0.000	0.060	0.000
P122	Swimming	0.151	0.157	0.111	0.164	0.048	0.000
P123	Shopping	0.335	0.105	0.090	0.076	0.108	0.200
P124	Surfing the internet	0.255	0.324	0.477	0.175	0.317	0.200
P125	Visiting a pub	0.025	0.043	0.075	0.082	0.084	0.000
P126	Snowboarding	0.000	0.014	0.000	0.012	0.006	0.000
P127	Anonymity	0.017	0.024	0.191	0.006	0.030	0.200
P128	Enthusiasm	0.201	0.190	0.055	0.246	0.269	0.100
P129	Heroism, glory	0.000	0.000	0.005	0.000	0.000	0.000
P130	Passion	0.008	0.095	0.030	0.088	0.078	0.200
P131	Recognition of performances	0.079	0.086	0.070	0.135	0.132	0.400
P132	Self-belief	0.397	0.238	0.176	0.216	0.293	0.400
P133	Social harmony	0.331	0.300	0.236	0.263	0.234	0.200
P134	Success in life	0.038	0.086	0.045	0.006	0.150	0.000
P135	Challenge, stimulation	0.038	0.100	0.040	0.175	0.228	0.100
P136	Expression, uniqueness	0.025	0.010	0.035	0.181	0.024	0.000
P137	Independence	0.540	0.243	0.518	0.538	0.635	0.400
P138	Privacy, tranquility	0.452	0.400	0.673	0.263	0.395	0.800
P139	Respect	0.607	0.486	0.402	0.398	0.521	1.000
P140	Self-fulfilment, growth	0.247	0.095	0.126	0.567	0.311	0.500
P141	Solidarity	0.167	0.314	0.201	0.327	0.234	0.100
P142	Enjoyable life	0.510	0.681	0.291	0.497	0.539	0.600

Appendix 5.2 Continued

q		1	2	3	4	5	6
ω_q		0.240	0.211	0.200	0.172	0.168	0.010
P143	Friendship	0.762	0.781	0.382	0.591	0.563	0.000
P144	Intimacy	0.084	0.124	0.095	0.246	0.060	0.000
P145	Rationality	0.017	0.038	0.146	0.135	0.192	0.200
P146	Security	0.347	0.224	0.296	0.170	0.120	0.000
P147	Social alliance	0.276	0.381	0.141	0.392	0.311	0.300
P148	Status	0.013	0.000	0.010	0.006	0.030	0.000